We claim:

1. A heterogeneous ion exchange material which comprises an ion exchange resin incorporated within a binder, the binder comprising a material selected from the group consisting of (i) a polyolefin copolymerized by a single site catalyst technology, (ii) a very low density polyethylene or ultra low density polyethylene processed using either Ziegler-Natta catalysts or Metallocene catalysts, (iii) a thermoplastic elastomeric olefin comprising a polypropylene continuous phase with an ethylene-propylene-diene monomer or ethylene-propylene rubber rubbery phase dispersed through the polypropylene continuous phase, and (iv) a thermoplastic vulcanizate comprising a polypropylene continuous phase with an ethylene-propylene-diene monomer, ethylene-propylene rubber, nitrile-butadiene rubber, natural rubber, ethylene vinyl acetate rubbery phase dispersed through the polypropylene continuous phase, a co-polymer of vinylidene fluoride and hexafluoropropylene, or a co-polymer of vinylidene fluoride and hexafluoropropylene and tetrafluoroethylene.

2. The heterogeneous ion exchange material of claim 1 wherein the binder is a metallocene catalyzed polyolefin.

3. The heterogeneous ion exchange membrane of claim 2, wherein the binder is a an alpha-olefin co-polymer.

4. The heterogeneous ion exchange membrane of claim 3, wherein the binder is an ethylene alpha-olefin co-polymer.

5. The heterogeneous ion exchange membrane of claim 4, wherein the binder is an ethylene octene co-polymer.

6. The heterogeneous ion exchange membrane of claim 3, wherein the binder is characterized by a crystallinity of less than 40%.

7. The heterogeneous ion exchange material of claim 1 wherein the binder is a very low density polyethylene or ultra low density polyethylene processed using either Ziegler-Natta catalysts or Metallocene catalysts.

8. The heterogeneous ion exchange material of claim 1 wherein the binder is a thermoplastic elastomeric olefin comprising a polypropylene continuous phase with an ethylene-propylene-diene monomer or ethylene-propylene rubber rubbery phase dispersed through the polypropylene continuous phase.

9. The heterogeneous ion exchange material of claim 1 wherein the binder is a thermoplastic vulcanizate comprising a polypropylene continuous phase with an ethylene-propylene-diene monomer, ethylene-propylene rubber, nitrile-butadiene rubber, natural rubber, ethylene vinyl acetate rubbery phase dispersed through the polypropylene continuous phase, a co-polymer

of vinylidene fluoride and hexafluoropropylene, or a co-polymer of vinylidene fluoride and hexafluoropropylene and tetrafluoroethylene.

10. A method for manufacturing an ion exchange membrane using advanced extrusion techniques, including computer-controlled material feed, computer-controlled automatic die thickness adjustment with independently adjustable lip segments and nuclear gauge detection with feed-back control.

11. A method for manufacturing an ion exchange membrane using advanced extrusion techniques, comprising the steps of:

extruding polymeric material through an auto-die, having a first lip block with a plurality of segments and a second lip block, at least one of said first lip block segments spaced from said second lip block, said at least one of said first lip block segments disposed at a first position;

measuring a first thickness of the extruded polymeric material with a sensor;

providing an input signal corresponding to said first thickness to a CPU;

processing said input signal in said CPU by comparing said input signal to a setpoint corresponding to a desired thickness;

providing an output signal; and

moving said at least one first lip block segment to a second position in response to said output signal to change the spacing between said at least one first lip block segment and said second lip block.

12. A method for manufacturing an ion exchange membrane using injection molding.